

CLAIMS

1. A method for assessing whether a test sample activates the intestinal tract immune system, comprising the steps of:

5 (a) contacting a test sample with a cell forced to express an intestinal tract tissue-expressed Toll-like receptor; and

(b) measuring activity of the Toll-like receptor using signal transduction in the cell as an indicator,

10 wherein the test sample is judged to be activating the intestinal tract immune system if the activity of the Toll-like receptor is increased as compared to activity of the Toll-like receptor in a cell not contacted with the test sample.

2. A method of screening for a sample that activates the intestinal tract immune system, comprising the steps of:

15 (a) assessing whether a plurality of test samples activate the intestinal tract immune system by the assessment method of claim 1; and

(b) selecting from the plurality of test samples those assessed to activate the intestinal tract immune system.

20 3. A method for producing a pharmaceutical composition that activates the intestinal tract immune system, comprising the steps of claim 2, and a further step of mixing the sample assessed to activate the intestinal tract immune system with a pharmaceutically acceptable carrier.

25 4. A method for assessing whether a test microorganism activates the intestinal tract immune system, comprising the steps of:

(a) preparing an extract from a test microorganism;

(b) contacting the extract with a cell forced to express an intestinal tract tissue-expressed Toll-like receptor; and

30 (c) measuring activity of the Toll-like receptor using signal transduction in the cell as an indicator,

wherein the test microorganism is judged to be activating the intestinal tract immune system if the activity of the Toll-like receptor is increased as compared to activity of the Toll-like receptor in a cell not contacted with the extract.

35 5. A method of screening for a microorganism that activates the intestinal tract immune

system, comprising the steps of:

(a) assessing whether a plurality of test microorganisms activate the intestinal tract immune system by the assessment method of claim 4; and

5 (b) selecting from the plurality of test microorganisms those assessed to activate the intestinal tract immune system.

6. A method for producing a food composition that activates the intestinal tract immune system, comprising the steps of claim 5, and a further step of mixing the microorganism assessed to activate the intestinal tract immune system with a dietarily acceptable carrier.

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7. The method of claim 6, wherein the microorganism is a lactic acid bacterium and the food composition is a dairy product.

8. The method of any one of claims 4 to 6, wherein the microorganism is a lactic acid
15 bacterium.

9. The method of claim 8, wherein the bacterium is a lactic acid bacterium.

10. A method for constructing a model intestinal immunocompetent cell, comprising the
20 step of introducing into a cell an expression vector comprising a DNA encoding an intestinal tract tissue-expressed Toll-like receptor.

11. Use of a cell forced to express an intestinal tract tissue-expressed Toll-like receptor as a model intestinal immunocompetent cell.

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12. The method of any one of claims 1 to 11, wherein the intestinal tract tissue is intestinal lymphoid tissue.

13. The method of claim 12, wherein the intestinal lymphoid tissue is Peyer's patch or
30 intestinal lymph node.

14. The method of any one of claims 1 to 13, wherein the Toll-like receptor is derived from swine.

35 15. The method of any one of claims 1 to 13, wherein the Toll-like receptor is Toll-like receptor 9.

16. A cell forced to express an intestinal tract tissue-expressed Toll-like receptor for use in the method of any one of claims 1 to 9.

5 17. A model intestinal immunocompetent cell constructed by introducing into a cell an expression vector comprising a DNA encoding an intestinal tract tissue-expressed Toll-like receptor.

10 18. The cell of claim 16 or 17, wherein the intestinal tract tissue is intestinal lymphoid tissue.

19. The cell of claim 18, wherein the intestinal lymphoid tissue is Peyer's patch or intestinal lymph node.

15 20. The cell of any one of claims 16 to 19, wherein the Toll-like receptor is derived from swine.

20 21. The method of any one of claims 16 to 19, wherein the Toll-like receptor is Toll-like receptor 9.